

Instituto Técnico Ricaldone
Salesianos 2021
Tercer año de Bachillerato



Actividad 1.
Matemáticas.

Sección: A4

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Ejercicio 1

$$f(x) = 5x^4 + x^3 - 4x$$

Factor 1

$$x$$

Factor 2

$$5x^3 + x^2 - 4$$

$$f'(x) = x(5x^3 + x^2 - 4)$$

$$= 1(5x^3 + x^2 - 4) + x(15x^2 + 2x)$$

$$= 5x^3 + x^2 - 4 + 15x^3 + 2x^2$$

$$= 20x^3 + 3x^2 - 4$$

$$f(x) = -3 - 7x + 6x^2$$

$$= 6x^2 - 7x - 3$$

$$2x - 3 = -9x$$

$$3x + 1 = 2x$$

$$-7x$$

Factor 1

$$(2x - 3)$$

Factor 2

$$(3x + 1)$$

$$f'(x) = (2x - 3)(3x + 1)$$

$$= (2)(3x + 1) + (2x - 3)(3)$$

$$= 6x + 2 + 6x - 9$$

$$= 12x - 7$$

$$f(x) = \frac{x+2}{x}$$

$$\begin{array}{cc} \text{Factor 1} & \text{Factor 2} \\ \left(-\frac{1}{x}\right) & (x+2) \end{array}$$

$$f'(x) = \left(-\frac{1}{x^2}\right)(x+2) + \left(\frac{1}{x}\right)(1)$$

$$f'(x) = \left(-\frac{x+2}{x^2}\right) + \frac{1}{x}$$

$$f'(x) = \frac{-x-(x+2)+x}{x^2} = \frac{-x-2+x}{x^2}$$

$$f'(x) = -\frac{2}{x^2}$$

$$f(x) = \frac{5x+5}{x^3}$$

$$\begin{array}{cc} \text{Factor 1} & \text{Factor 2} \\ \frac{1}{x^3} & 5x+5 \end{array}$$

$$\begin{aligned} &= (0)(5) - (1)(3x^2) \\ &= -3x^2 = \frac{-3x^2}{x^6} \end{aligned}$$

$$f'(x) = \left(-\frac{3}{x^4}\right)(5x+5) + \left(\frac{1}{x^3}\right)(5)$$

$$= \frac{-15x+15}{x^4} + \frac{5}{x^3} = \frac{(-15x+15) + (5x)}{x^4}$$

$$= \frac{-10x+15}{x^4} = -\frac{10x+15}{x^4}$$

$$f(x) = x^2 + 7x + 12$$

Factor 1
 $(x+4)$

Factor 2
 $(x+3)$

$$f'(x) = (1)(x+3) + (x+4)(1)$$

$$= x+3 + x+4$$

$$= 2x+7$$

Ejercicio 5

$$5. f(x) = (x+3)(x+3)$$

$$= x^2 + 3x + 3x + 9$$

$$= x^2 + 6x + 9$$

$$= 2x + 6 + 0$$

$$f'(x) = 2x + 6$$

Ejercicio 8

$$8) g(t) = \frac{t^3 - 8}{t - 2} = \frac{(t-2)(t^2 + 2t + 4)}{(t-2)}$$

$$g'(t) = t^2 + 2t + 4$$

$$g'(t) = (t^2)' + (2t)' + (4)'$$

$$g'(t) = 2x + 2 + 0$$

$$g'(t) = 2x + 2$$

$$R// g'(t) = 2x + 2$$

Ejercicio 22

$$\begin{aligned} f(x) &= \frac{5x+1}{x^2-4x+3} = \frac{5(x^2-4x+3) - (2x-4)(5x+1)}{(x^2-4x+3)^2} \\ &\quad \downarrow \\ &\quad \frac{(5x^2 - 20x + 15) - (10x^2 + 2x - 20x - 4)}{(x^2 - 4x + 3)^2} \\ f'(x) &= \frac{-5x^2 - 2x + 19}{(x^2 - 4x + 3)^2} \end{aligned}$$

Ejercicio 38

$$38. (f \cdot h)'$$

$$f(x) = x^2 + 5x - 3$$

$$h(x) = \frac{2}{x-4}$$

$$(f \cdot h)' = (x^2 + 5x - 3) \left(\frac{2(-1)x^{-2}}{(x-4)^2} \right) = (x)^{-1}$$

$$= \frac{2x^2 + 10x - 6}{x-4}$$

$$= \frac{(4x + 10)(x-4) - (2x^2 + 10x - 6)(1)}{(x-4)^2}$$

$$= \frac{4x^2 - 16x + 10x - 40 - 2x^2 - 10x + 6}{(x-4)^2}$$

$$(f \cdot h)' = \frac{2x^2 - 16x - 34}{(x-4)^2}$$

Ejercicio 42

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$$f(x) = x^2 + 5x - 3 \quad , \quad g(x) = 4x^3 - 2x^2 - 8x + 4$$

$$(f \circ g)' = \frac{(4x^3 - 2x^2 - 8x + 4)(2x + 5) - (x^2 + 5x - 3)(12x^2 - 4x - 8)}{(4x^3 - 2x^2 - 8x + 4)^2}$$

a)

$$8x^4 + 16x^3 - 26x^2 - 36x + 20 \quad \checkmark$$

b)

$$-12x^4 - 64x^3 + 24x^2 + 52x - 24 \quad \checkmark$$

Proceso

a)

$$8x^4 - 4x^3 + 20x^3 - 26x^2 - 20x^2 + 8x - 40x + 20$$

b)

$$-(12x^4 + 60x^3 + 4x^3 - 36x^2 + 20x^2 - 8x^2 - 12x - 40x + 24)$$

$$(f \circ g)' = \frac{-4x^4 - 80x^3 - 2x^2 + 20x - 4}{(4x^3 - 2x^2 - 8x + 4)^2}$$

$$R1 = (f \circ g)' = \frac{-4x^4 - 80x^3 - 2x^2 + 20x - 4}{(4x^3 - 2x^2 - 8x + 4)^2}$$